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Citrus Insect Control For May, 1957

A Summer Application Of Zineb For The Control Of Citrus Fruit Russet

Preliminary Investigations On Dieback Of Young Transplanted Citrus Trees

Agricultural Research To Make Agricultural Chemicals Safe

Status Of Medfly Eradication Program In Florida

Mathews Made Chairman, Edwards V- Chairman Federal Farm Credit Board

Spotted Alfalfa Aphid Threatens Nations Alfalfa Crop

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VOL. 38 — NO. 5 MAY, 1957 BARTOW, FLORIDA

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R. M. Pratt

Citrus Insect Control For May 1957

R. B. Johnson

R. B. JOHNSON*
R. M. PRATT
W. L. THOMPSON
Florida Citrus Experiment Station, Lake Alfred

W. L. Thompson

Red and purple scale activity was high in April, with an unusually high level of hatching. The percent of purple scales in the young stages will continue to be high in early May, and a high percent of red scales will be in the young stages through the month. Scale populations will be below average in the late spring and summer.

Purple mite infestations are generally low. There will be an increasing trend in May but infestations will be below average, and in most groves will be much lower than in the last two years.

Rust mite infestations were about average in April. The situation in May will depend on the weather. If there is more moisture than usual, an early build-up of rust mite is to be expected.

Mealybug infestations are a little above average and some heavy infestations are to be expected. Six-spotted mite infestations are almost non-existant. An increase is to be expected in May, but there will be few infestations of commercial significance. Texas citrus mites are on the increase and in some groves will cause more trouble than purple mite.

SPRAY PROGRAM

Last year at this time nearly all groves were in a weakened condition from a long seige of dry weather and most trees were highly susceptible to mite and insect damage as well as abnormally subject to injury from many sprays. This year, however, the situation is somewhat reversed. There has been plenty of moisture and most trees are in sufficiently good condition to withstand more rough treatment than they could a year ago. This means that although purple mite and Texas citrus mite will scratch the leaves in many groves and give the foliage a grayish appearance, they will cause very little mesophyll collapse or leaf drop of commercial importance unless the weather turns dry. It also means that oil or oil-parathion sprays for scale control or lime-sulfur sprays for control of rust mite or six-spotted mite may be used without much danger of shocking trees into a serious drop of leaves or fruit.

With these ideas in mind, then, it appears that rust mite will be the chief problem in May, but that scale insects will occasionally be numerous enough to complicate the control picture. In addition, mealybugs and, here and there, some soft brown scale or six-spotted mite may also be a problem.

The desirability of controlling rust mite should not be questioned at any time, but whether to apply scalicides in May is another matter. In most groves, the percentage of scale in the younger stages will be high in early May. This means that good control may be expected because the younger stages are easily killed while the older stages are not. Therefore, the application of scalicides is recommended in May where scale populations are so high that they will become too serious to control with the regular July application. It should also be noted that an April or May application may be a desirable supplement to the regular July scalicide in preventing scale-caused green spots on tangerines. In any event, a May scalicide should not be depended upon to replace the regular summer application for year-round control.

Mealybugs should be controlled as soon as possible because, regardless of weather conditions, they can cause a serious fruit drop as well as disfigure the friut that doesn't drop.

Six-spotted mites can cause a serious leaf drop if not near defoliation, especially on grapefruit. This mite should be controlled wherever it occurs in threatening numbers.

SCALE AND MITE ACTIVITY BY DISTRICTS*

District	Purple Scale	Red Scale	Purple Mite	Rust Mite on leaves
West Coast	4.77	1.33	1.27	1.43
Indian River	4.78	3.67	.87	1.07
Upper East Coast	4.93	0	.13	.66
Gainesville	5.00	.20	.40	.20
Orlando	3.89	.18	.74	.75
Brooksville	4.24	.31	1.75	.84
Ridge	5.13	4.41	1.83	1.53
Bartow	5.80	4.20	1.20	1.23
State Average	4.69	3.41	1.15	1.00
Last Year	4.41	3.25	1.99	1.21

*Third week in April. Activity is computed from populations, amount of hatching of scales, and number of groves with increasing or decreasing infestations. Activity is considered high if above 4.0 for purple scale, 3.0 for red scale, and 1.5 for mites.

Rust Mite Control: May is an excellent time to clean up rust mite infestations before time to apply summer scalicides. For this purpose, lime-sulfur at 1 gallon plus 5 pounds of wettable sulfur per 100 gallons of spray is the most satisfactory spray for control of rust mite. Lime-sulfur is somewhat toxic, however, and although it will cause no serious damage to healthy trees, it may produce a drop of older leaves, especially on weak trees. Do not use lime-sulfur with copper compounds.

Wettable sulfur at 10 pounds per 100 gallons, although somewhat less effective than the combination of lime-sulfur and wettable sulfur, is still excellent for control of rust mite. Where wettable sulfur is to be applied in combination with parathion, malathion or a miticide, 5 pounds is adequate.

Sulfur sprays are more effective than dusts, especially during wet weather, but sulfur dusts are satis-

(Continued on page 28)

*Written April 25, 1957. Reports of surveys by Harold Holtsberg, Fort Pierce; J. W. Davis, Tavares; K. G. Townsend, Tampa; T. B. Hallam, Avon Park; and L. M. Sutton, Lake Alfred.

Mathews Elected Chairman; Edwards V-Chairman, Federal Farm Credit Board . . .

A farmer and rancher from Texas has been elected chairman of the Federal Farm Credit Board. He is C. H. Matthews, of Eagle Lake, Texas, who was elected to a one year term as chairman during the Board's annual meeting in Washington, D. C. this week.

Marshall H. Edwards, Bartow, Florida, was elected vice chairman. The Board also reelected J. M. Selby, Silver Spring, Md., secretary, and T. L. Piper, Vienna, Va., as assistant secretary. Mr. Matthews and Mr. Edwards were original appointees to the Board by President Eisenhower in 1953.

The 13 member Federal Farm Credit Board sets the policies for the cooperative Farm Credit System in the U. S. which is supervised by the Farm Credit Administration. The Farm Credit System includes 12 Federal land banks, 12 intermediate credit banks, 13 banks for cooperatives, nearly 1,100 local national farm loan associations, and 497 local production credit assosiations. Farmers and their cooperatives last year borrowed $2.8 billion from the cooperative Farm Credit System.

Mr. Matthews, who served as vice chairman of the Board for the past year, raises rice, cotton, maize, alfalfa and cattle on his Texas ranch. Matthews has had wide experience in credit affairs. He formerly represented the Houston district on the National Production Credit Association Committee and was a former secretary of the Production Credit Corporation of Houston. He is also past president of his local production credit assciation at El Campo, Texas.

Mr. Edwards owns and operates a 250-acre citrus grove at Bartow. He is past president of the Polk County (Fla.) National Farm Loan Association; former chairman of the National Farm Loan Associations' Stockholders Committee in his district; and a former member of the National Farm Loan Association Advisory and Executive Committees.

Citrus Queen Starts On European Tour

Beautiful, brunette Frances Layton of Winter Haven, reigning Florida Citrus Queen, has embarked on a 10,000-mile good will tour which will take her to several important European citrus markets, culminating with a whirlwind round of American markets.

Since her selection at the 1957 queen, out of a field of 21 girls during the 1957 Florida Citrus Exposition here, Frances has made many appearances under the sponsorship of the Florida Citrus Commission. On the current international trip she flew to Paris via Lufthansa German Air Lines on the Azores-Lisbon route.

In the French capital she was greeted by Alfred LaRoque, bilingual European representative of the citrus commission who has scheduled her visits to include many of the bigger cities which are prime customers for fresh and processed Florida citrus fruits.

In commenting on Queen Frances'

(Continued on page 21)

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A Summer Application Of Zineb For The Control Of Citrus Fruit Russet

BY FRAN E. FISHER
CITRUS EXPERIMENT STATION
LAKE ALFRED

Russet, in the sense used here, is an external, superficial blemish of citrus fruits that appears after the fruit is well sized. Fig. 1 shows several degrees of russeting on mature Ruby Red grapefruit. The color of the injured areas ranges from bronze through shades of brown to black. Various degrees of injury have been given different names. A slight injury on oranges is called "golden". A more severe type is called "black russet"; here the epidermal layers are somewhat thickened, leading ultimately to a "mud-cake" appearence somewhat similar to mud-cake melanose (due to the fungus **Diaporthe citri** Fawc.). Another form, referred to as "tear-stain," resembles the pattern of tear-staining caused by the melanose fungus. All other types, generally brown in color, are known simply as "russet".

The blemish lowers the commercial grade of fruit and when severe prevents fruit from attaining normal size. Injured fruits dehydrate and decay more rapidly than those that are unaffected. The longer russeted fruits remain on the tree, the larger the loss due to dehydration, decay and dropping. Severly injured fruit may be unmarketable.

Russet has been a problem to the Florida citrus grower since the 1870's. At first, russet was thought to be due to a fungus or to adverse soil conditions; more recently, it has been attributed to the citrus rust mite (**Phyllocoptruta oleivora** (Ashm.)). Currently some 50,000 tons of sulfur are applied annually in attempts to control this mite.

In screening 20 fungicidal chemicals primarily for greasy spot control during the summer of 1954, it was found that several of these materials would reduce the amount of russet. Some of these were selected for further trials.

In 1955, trees receiving no sulfur after the post-bloom spray but sprayed with a single application of zineb between June 29 and August 3, 1955, had more bright fruit than those receiving a single application of captan, oil emulsion, ziram, copper oxychloride sulfate, silver salicylate, parathion-sulfur, and lime-sulfur plus wettable sulfur during the same period. Pineapple oranges sprayed with zineb the end of July were 95 percent bright when examined in February, 1956; Valencias sprayed the first part of August, 90 percent. Trees sprayed once on the same dates with a combination of wettable sulfur and lime-sulfur yielded 85 percent bright Pineapples, and 20 to 50 percent bright Valencias. On both varieties, fruits treated with captan were comparable to those treated with sulfur. Bright fruit on non-sprayed trees constituted less than 20 percent of the crop.

In 1956, the most promising material, zineb (zinc ethylenebis (dithiocarbamate,) was subjected to more extensive trials in commercial groves. The formulation of zineb known as **Dithane Z-78** was used in these tests; zineb is also marketed under various other trade names.

Materials and combinations used in 1956 were intended to learn not only the lowest dosage rate necessary for control, but also the effect

of zineb in combination with oil emulsion and parathion, one or both of which are ordinarily used in summer for control of scale insects. If a combined spray can be applied for control of both scale and russet, considerable saving in expense of application would result.

Test made on some 200 acres of groves included the following varieties: Ruby Red, Marsh, and Duncan grapefruit; Hamlin, Pineapple, Valencia, and Temple oranges; and tangerines. As in 1955, various materials, including sulfur, were applied to all groves in the post-bloom period. Because of the waxy nature of citrus fruit, a wetting agent was added to each spray in 1955 and 1956 at the rate of one-half ounce per 100 gallons for treatments containing oil and one ounce for others. The particular material used in these tests is marketed under the trade name **Sprayspread.**

Zineb, at the rate of one pound per 100 gallons applied between July 2 and August 3, 1956, controlled russet on every variety tested. The application of one-half pound was not effective and amounts larger than one pound proved unnecessary. The same results were obtained when zineb was combined with a mixture of oil emulsion and parathion.

Packinghouse records made the end of October and during November may be summarized as follows: Duncan grapefruit treated on July 17th with zineb yielded 99 percent bright fruit whereas non-sprayed trees produced only 1.5 percent bright fruit. Ruby Red grapefruit sprayed on July 16th had 99 percent bright fruit compared to only 16 percent on non-sprayed trees (See Fig. 1). In the case of Hamlins, all fruit graded 100 percent bright following zineb applied on July 16th, while only 80 percent were bright on non-sprayed trees. Trees sprayed with a combination of oil-parathion yielded fruit comparable to those not sprayed. Field examinations of later maturing varieties showed similar results. Observations of the fruit remaining on the trees showed no development of russet up to February 1, 1957. In these trials, a single application of zineb controlled russet as well as or better than did up to 5 summer and fall applications of sulfur in adjoining groves.

Although zineb has been used as a fungicide on other crops for a number of years, no reports of miticidal effect are found in the literature. However, rust-mite populations were low 7 months following the application of zineb. It should be pointed out that russet has never been reproduced under controlled conditions in the laboratory. Circumstantial evidence, obtained under grove conditions, indicates that more critical work will be necessary in order to determine the true cause of the blemish. Preliminary evidence indicates that a fungus may be involved.

Present information is not adequate to recommend that zineb be substituted for sulfur. Experiments have been limited to the dates of application mentioned above, and there is no information on its use at other times of the year or against other pests. The present sulfur program should be generally continued until more information is available, because a radical change in spray program may upset the prevailing biological balance and result in unforseeable difficulties with insects and mites. Information on the summer use of zineb is reported at this time to enable growers, who so desire, to make small-scale commercial trials during the coming summer.

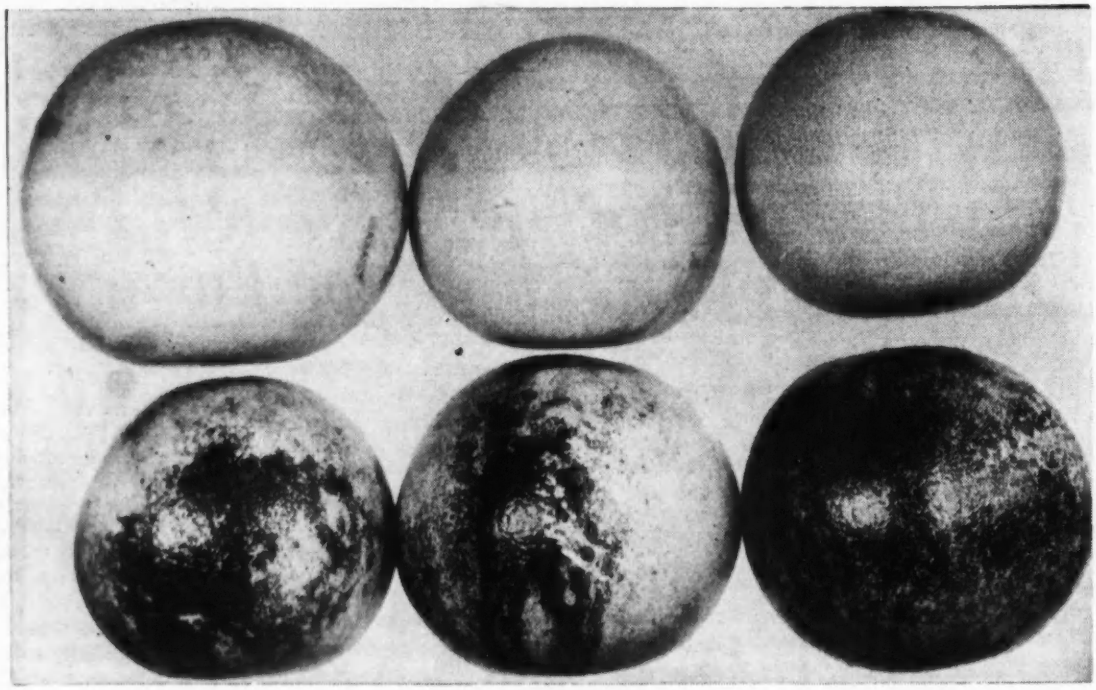


Figure 1. Ruby Red Grapefruit in the upper row were sprayed with zineb (1 lb. 100 gal.) on July 16, 1956, and those in the lower row were from the non-sprayed control.

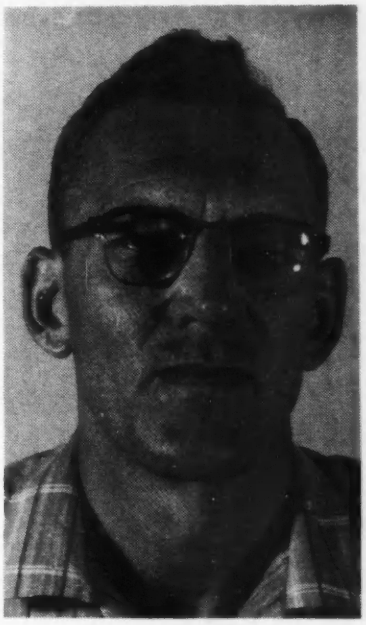
CITRUS NURSERY STOCK MOVES IN BIG VOLUME

More citrus nursery stock has moved in 1955-56 from Florida nurseries to destinations in the state than in any previous season, according to Zach Savage, economist with the Florida Agricultural Experiment Station.

The agricultural economist says lemon stock was used most in the past three years in the citrus industry. Sixty-nine percent of the movement was on lemon last season. For the first time, Cleopatra was second in importance. Sour orange stock was third, falling from 25 percent of the movement in 153-54 to about 12 percent last season. These three stocks, together with sweet seedling, make up 97 percent of the movement of stock.

Status of Medfly Eradication Program In Florida

. . . Based On A Talk By . . .



G. G. ROHWER
AREA SUPERVISOR, SOUTHERN REGION PLANT PEST CONTROL DIVISION,
AT GULF COAST CITRUS INSTITUTE, DADE CITY

The Mediterranean fruit fly was found in Miami last year on April 13. This is the second time that this foreign pest has been introduced into the State of Florida. The first introduction was successfully eradicated during the 1929-30 campaign. Unlike the 1929-30 introduction, however, the Medfly in 1956 was introduced into the largest metropolitan area of the state, and then spread to other metropolitan areas and, to a lesser extent, into citrusgrowing sections. The 1929-30 infestation was predominately in the citrus belt of Florida. The areas found infested this past year included a wide range of host plants which fruit throughout the year, which made it impractical, if not impossible, to eradicate the pest through the host fruit elimination method used successfully in the 1929-30 campaign.

Fortunately, U. S. Department of Agriculture researchers in Hawaii have been doing considerable work on the Mediterranean fruit fly, developing better means of inspection and control. Therefore, effective methods were available for use in any type of infested area.

The program being carried on is based on the work of many organizations, and is the large-scale application of practical research work. It is jointly financed and administered by the State Plant Board of Florida and the Plant Pest Control Division of the U. S. Department of Agriculture. Among other agencies which have participated are the Florida Experiment Stations, Florida Extension Service, research agencies of the U. S. Department of Agriculture, and many others, including press, radio, and television. We also should recognize the work which has been done by industry, especially by the chemical companies, which has resulted in the development and manufacture of new agricultural chemicals; for had it not been for the accomplishments of these commercial agencies we would not have had the new insecticides which are used in the eradication treatments.

The life cycle of the Mediterranean fruit fly covers an approximate 30-day period during summer conditions in Florida. The duration of the cycle is affected by weather conditions, with a slowing down of activity during the winter months; however, under Florida climatic conditions ten generations a year can be expected at the Orlando latitude.

Information on the biology of an insect is of extreme importance in guiding any eradication program; for it is only through information of this type that it is possible to adequately determined when and how to kill the pest. The life cycle briefly is as follows: The adult flies emerge from the soil and feed for approximately 10 days before laying viable eggs. After the eggs are laid under the skin of the fruit it requires one to two days to hatch into tiny maggots or larvae. The larvae feed in the fruit for approximately 10 days after which they leave the fruit to pupate in the soil. Infested fruit ordinarily drops to the ground prematurely to allow this pupation. The pupal period, or resting stage, lasts another 10 days, when the newly transformed adult is ready to emerge from the soil.

This life history data is for the summer season. The cycle is lengthened slightly during the cooler fall and winter months. Information as to the exact length of the life cycle is of extreme importance in guiding eradication work.

Before any successful control treatments can be applied it is, of course, necessary to determine exactly where the Mediterranean fruit fly exists. This may be accomplished through fruit inspectors for the larval stage of the insect, but principally is done through trapping operations to determine the location of the adult flies. In the early stages of the present campaign in Florida very few traps were available. These were a hand-blown glass invaginated type in which a protein attractant was used which attracted both male and female flies. These traps, however, not only were costly but also were hard to obtain in necessary quantities in a short period of time.

Fortunately, just before the Medfly was found in Florida, research workers had developed information that oil of angelica seed was attractive to the male fly. Since no field experiments had been conducted with this material, large-scale field tests immediately were set up in the the Miami area using this lure with a new type of trap. Actually, several types of traps were tested hurriedly under field conditions to determine which would be most effective. This resulted in the development of the presently used trap, a modification of a plastic refrigerator jar. Needless to say, this type of container was readily available and much cheaper than the glass trap. This development saved the program thousands of dollars and made it possible to rapidly increase our trapping operations. Furthermore, the oil of angelica was sereral times more effective than previously used lures. As oil of angelica was attractive to the male fly only, it still was desirable and necessary to use a relatively small number of glass traps to obtain female flies as a check on control operations. It was possible through an examination of the females to determine whether the flies were

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gravid and had been missed in the spray treatments. There are now approximately 50,315 traps in operation in the State of Florida with 7,000 more on order which will be put in the field in the very near future.

In order to make any eradication program effective, it is necessary to apply quarantine procedures to prevent the spread of the pest artifically until such time as it has been brought under control or eradicated. Needless to say, the quarantine involved principally the movement of host fruits and vegetables. On the other hand, since the pupae are found in the soil, it was necessary also to regulate nursery stock movements.

In the early stages of the campaign, road blocks were set up around heavily infested metropolitan areas in order to prevent the outward movement of infested host material. It was of considerable surprise to program personnel that so much material was confiscated at these road stations in view of wide publicity given to the necessity for quarantine action, and to request that the public not take host material out of an infested area. In little more than five months of operation 4,000,000 vehicles were checked, with inspectors confiscating more than 1,200 tons of fruit and vegetables.

Again, fortunately, research had come to the rescue and worked out procedures whereby host material could be treated successfully as a means of eliminating infestation. It was possible, therefore, to permit the movement of material from regulated areas to other states. Had such treatment not been available no other state would have been willing to accept material coming from the State of Florida until such time that the fly had been eradicated. Treatments were worked out whereby nurseries located in infested areas could, through the use of insecticides, make nursery stock eligible for movement. In addition, fumigation procedures were worked out for citrus and other host fruits. Ethylene dibromide is used as the fumigant for the treatment of most citrus products. In this process the gas is injected into a gas-tight chamber provided with an adequate circulation system. Proper temperatures are maintained for a period of two hours, and, after aeration, the fruit may be moved safely to any point without fear of spreading the Mediterranean fruit fly and without risk to the consuming public.

Fumigation procedures also were

used early in the campaign for host vegetables. However, since vegetables are relatively poor hosts of the Medfly, it was possible, prior to the shipping season of this past winter, to resort to an insecticidal treatment in the environs of vegetable fields in those cases where infestations still persisted. This was indeed fortunate since, for some host vegetables, the fumigation treatment was not too satisfactory.

In order to handle the volume of citrus shipped from the State of Florida in the present campaign it was necessary to construct 263 fumigation chambers and as of this date 4,517,669 boxes of fruit have been fumigated. Needless to say, this is a very small portion of the citrus fresh fruit shipped from the State of Florida, and presented a minor problem to the citrus industry in comparison with the fumigation of all fruit which would leave the state. This would have been required had the eradication program not progressed satisfactorily.

In the eradication treatments, work initially began with the destruction of host fruit, since that was the basis for eradication in the 1929-30 campaign. It was soon found, however, that this was not practical, and also it was soon learned that research had developed information regarding a practical and safe insecticidal program.

The principal means of eradicating the Medfly consists of the application of a malathion bait spray by plane. In the early stages of the campaign one-half pound of actual malathion (two pounds of 25 percent wettable) was mixed with one pound of a protein hydrolysate and sufficient water to produce one gallon. This amount of mixture was applied to an acre of land. The treatments were made at 10-day intervals and continued for 30 days beyond the recovery of the last Medfly. As cooler weather arrived in the fall it was necessary to extend the treatments to 40, then to 50, and to 60, and eventually to 70 days after the recovery of the last adult.

It was found that the effectiveness of the spray treatments could be increased without increasing cost if 3/10 pound of malathion per acre and 6/10 pound of protein hydrolysate bait were applied on a 1-week schedule rather than a 10-day schedule. This made it possible to assure applications being made well within the 10-day period required for the adult fly to become sexually mature. Also, more applications assured a better distribution of the insecticide. Incidentally the reduced rates of insecticides and bait offset the increased cost of applying the material.

During the eradication campagin 784,137 acres were treated one or more times with bait sprays. The treatments on this land have accounted for the spraying of 6,281,112 aggregate acres of land. The month during which the largest acreage was treated was July, when more than 1,500,000 acres were treated in that month alone. There are now under treatment in the state of Florida 10,130 acres and on the basis of current information it is expected that the repeat treatments to this land will account for the treatments of 42,790 additional aggregate acres.

In addition to the bait sprays, surface applications of insecticides were applied to the soil. A granular insecticide was utilized, since a material in this form could be easily applied and, in addition, would not adhere to the foliage of the plants. Therefore, there was no hazard when applied in residential areas. Dieldrin was used in this part of the campagin and was applied at the rate of 5 pounds of actual material, or 50 pounds of 10 percent granular. The applications were restricted to the area under the host fruits.

The heavy surface applications of dieldrin have been applied to 29,104 acres in the State of Florida, 82 percent of which was applied by hand seeders and the remaining by aircraft.

Infestations have been found in 28 Florida counties and apparently have been eradicated from 24 counties. Treatments are still under way by aircraft in 4 counties, and all quarantine restrictions have been lifted from 20 counties.

In conclusion, I would like to emphasize the necessity to be constantly on the alert for the Mediterranean fruit fly and, in addition to this pest, other foreign introductions. For example, the Oriental or melon fruit fly or the Queensland fruit fly might just as well have been introduced into Florida as was the Medfly. These fruit flies, likewise, would be a terrific pest to the State of Florida. In addition, all of you are familiar with quick decline of citrus which wiped out the citrus industry in a very short period of time in most South American countries. This disease is spread by the black citrus aphid which is not known to be present in Florida. Should this insect be introduced and go undetected it likewise could cause severe damage to Florida citrus production. It is hoped that satisfactory arrangements will be made for a continued trapping or alert program so that we will be on the lookout for various foreign agricultural pests in order that they may be quickly eleminated should they be introduced. It is humanly impossible for the first line of defense, namely foreign quarantine work, to completely stop the introduction of all pests; therefore, our second line of defense must be an adequate survey program to detect any unwanted visitors and quickly bring them under control.

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The tilling rotor works the ground thoroughly for good aeration and moisture intake. Rotor can be set to till as shallow as ½ inch near the root crowns . . . as deep as 4 inches away from the tree. Tractor creeper gear permits excellent work even in Bermuda. Constant PTO allows stationary working of humps of grass, leaving land practically level.

Fertilizer applied ahead of the rotor is thoroughly worked into the soil. Rate of application is ½ to 6 pounds per tree. Automatic control shuts off fertilizer when you raise the hoe for transport. Get full information from the manufacturer or any of the J. I. Case dealers listed below.

Gentlemen:

"I can hoe 1000 to 1200 trees per 10-hour day. Hoed 50,000 trees from September through December '56.

"Busting crust is a big feature—aerates soil, leads moisture to roots. Doesn't cut crownroots—shallow at base of tree, 2½ to 4 inches at the tree's water shed.

"I followed a rotary cutter in tall Johnson Grass. Hoe thoroughly chewed up stubble and roots.

"You can just hoe around the tree, leave weeds or cover crop between tree rows to control wind erosion."

R. J. Patrick

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Call Now For A Free Demonstration

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This Is No Experiment . . . Over 80 Machines Sold In Last Six Months

Mutual Says 15-Point Program "Pursued And Achieved"

Florida Citrus Mutual told its grower members in its weekly membership publication that a 15-point program adopted by its board of directors last September has been "vigorously pursued and largely achieved."

Mutual said it was making the progress report at this time because the harvesting season is past the halfway mark.

The big cooperative said it had kept itself constantly alert and ready on a moment's notice to release specific dollars and cents figures on the economic value of the grower's fruit "when deemed necessary by the board of directors." So far, Mutual said, it has kept growers "prepared as to what constitutes their fair share of the consumer's dollar . . . through frequent market analyses."

Mutual said it had continued to stress the urgent need of giving the consumer the finest quality fruit or fruit product possible and "this year Mutual has pushed for comprehensive studies to improve the quality of frozen orange concentrate." The cooperative said it planned to publish "a long series of articles on growing quality fruit," and is supporting efforts aimed at seeing that only the best quality fruit goes to the fresh fruit market.

"Quality concentrate is a 'must,'" Mutual states, recalling that it had emphasized this in editorials last September and again last month in its membership publication, the Triangle.

Mutual forecast "important developments" in research to develop new outlets for citrus.

"Mutual has created a new products development division in recognition of the work still to be accomplished on citrus research at all levels," the article states. "There will be important developments here in the future—developments which will greatly aid the grower members of Florida Citrus Mutual and the industry."

With the Mediterranean fruit fly virtually eradicated, the big cooperative states that a forecast it made last September that "all existing points of distribution will be kept open and the crop moved out" has been borne out by developments.

"Federal and state authorities say Mutual's help was and is invaluable," the article states." - - - Mutual will continue to watch this and to advise and help on a moment's notice."

Fresh chilled orange juice and grapefruit juice, being distributed by some of the country's biggest food companies, is described as a "dramatic new outlet" with "important developments" forecast. Mutual said its new products development division would help expand this new and rapidly growing outlet.

Mutual said it was keeping a close watch on all legislative and governmental activities affecting citrus growers.

"Mutual continues to guard the industry's exemption from overtime provisions of the wage-hour law," the article states, "strict enforcement of quarantine regulations to prevent introduction of pests and diseases, precention of unreasonable labeling requirements under the federal food and drug law."

So far as the newly convened Florida legislature is concerned, the cooperative states that four items promised in September have been included, along with several others, in an industry legislative program.

Several items involving grapefruit have been completed, Mutual reported, and a new project is underway for "introduction and mass distribution of a silver-plated grapefruit spoon as a further stimulus to greater fresh grapefruit demand."

Mutual said grapefruit prices were "much better than last season, reflecting improved relationship between supply and demand." It promised to keep working on such things as higher quality standards, growing better grapefruit, research to uncover profitable by-products, exports and use of grapefruit in the federal school lunch program.

Exports have "assumed a dramatic role in the marketing of fresh and processed citrus crops following creation of Mutual's export division," the article states, and the importance of this outlet will continue to be recognized.

Mutual said it was continuing a close watch on efforts to solve the state's water problem but the need for a special committee in Mutual was eliminated when Mutual's general manager Robert W. Rutledge, was appointed chairman of the public information committee of the Florida water resources study commission.

CALIFORNIA NAVEL MARKETING AGREEMENT CONTINUES

Continuance of the Federal marketing agreement and order program regulating the handling of Navel oranges grown in Arizona and that part of California below the 37 Parallel was announced recently by the U. S. Department of Agriculture.

Continuance of the agreement and the amended order was favored by 92.8 percent of growers voting in a referendum. Of the volume of production voted, 91.7 percent was for continuance of the program.

Provisions of the agreement and order require that a referendum be held biennially. The referendum was conducted during the period February 11 through February 20, 1957.

CONTINENTAL CAN COMPANY RECEIVES HONOR AWARD

Continental Can Company's new $7,500,000 Metal Research & Development headquarters has won the 1957 Honor Award from the Chicago Association of Commerce and Industry and the Chicago Chapter of the American Institute of Architects as the outstanding new industrial building in the area.

The research center, employing 800 scientists and technicians, is the largest and most modern completely integrated facility of its type.

SOUTHERN DOLOMITE
PALMETTO, FLORIDA
PHONE: BRADENTON 2-1411

NOTES OF THE TRADE

Pictured, left to right: W. C. Duesler, vice president J. I. Case Co., Racine, Wis., "Ted" Conner, Pounds Tractor Co., Winter Haven, and J. T. Brown, president J. I. Case Co.

Polk Tractor Dealer Wins Trophy Award

H. C. "Ten" Conner, of Pounds Tractor Co., Winter Haven, Florida, J. I. Case dealer returned recently from a week-long tour of principal Case factories in recognition of his outstanding sales record during the past year. Highlight of the trip was the presentation of trophy awards to each of the ten high dealers in the United States and the five high dealers in Canada. Awards were made at an evening banquet in Racine, Wisconsin, home office of the company, by John T. Brown, president, and W. C. Duesler, vice president in charge of sales in the United States and Canada. The dealers being honored came from localities scattered all the way from Florida to British Columbia and from North Carolina to California.

At the Racine plant the visitors witnessed the building of the most recent addition to the Case Tractor line, the six-plow 600 built in diesel and LP gas models. At the Rockford, Illinois plant the dealers saw the various types of mounted and drawn machines being manufactured. Traveling on to Rock Island, Illinois and Bettendorf, Iowa, the sales leaders learned how Case 300 Tractors and all types of combines including the No. 150 self-propelled are made.

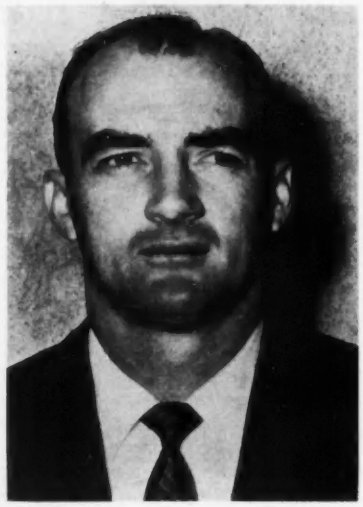
Dolomite Products Names New Field Representative

Fred Montsdeoca, of Avon Park, widely known athlete and football and baseball coach, has been appointed field representative for Dolomite Products, Inc., of Ocala, producers of liming materials.

Montsdeoca, it was announced by W. M. Palmer, Jr., assistant to the president, will be situated at Vero Beach.

Prior to entering the University of Florida, Montsedoca attended Georgia Military College at Milledgeville, Georgia, and while at the University, he earned letters in both football and baseball and captained the baseball team in his senior year.

After graduation in 1950, he became an assistant coach of both the football and baseball teams at the University and during off season, he played professional baseball in



FRED MONTSDEOCA

the Florida International League and the Florida State League. In 1953 he was called to active duty in the U. S. Army Air Force, and while in the service, coached the Patrick Air Force baseball team.

After his discharge from the Air Force, he joined Coach John Sauer's staff as baseball coach and assistant coach at The Citadel, Charleston, S. C.

Montsdeoca is married to the former Miss Yvonne Head, of Avon Park, and they have one daughter, Ann Leigh. His family has been long established in the Avon Park area, where they operate a ranch, and he has had considerable experience in the cattle raising business.

Lime Growers And Handlers To Be Polled On Marketing Order Program . . .

Florida growers and handlers of limes will be polled to determine whether they wish to continue the amended marketing agreement and order which regulates the handling of limes grown in Florida, the U. S.

Department of Agriculture announced on April 24th.

Provisions of the marketing agreement and order, originally effective June 15th, 1955, require that a referendum of the lime growers and a poll of the handlers be conducted as soon as practicable after the close of the marketing order's fiscal year ending March 31, 1957.

The period during which the referendum and poll will be conducted and the manner of voting will be announced at an early date by M. F. Miller, Field Representative, Fruit and Vegetable Division, Agricultural Marketing Service, U. S. Department of Agriculture, P. O. Box 19, Lakeland.

Grow Your Own And Save On Landscaping

You can save money by growing shrubs and plants to beautify your home grounds. This, home demonstration agent Ray Baxter says, is one of the major reasons for the big interest lately in plant propagation in Citrus County. Not only is this method cheaper but you don't run as much risk of introducing strange diseases, insects or nematodes to your locale.

Air layering is one of the most popular ways of securing your own young plants from a mature one. It is commonly done with azaleas, magnolias and camellias, according to Jasper Joiner, ornamental horticulturist with the Florida Agricultural Extension Service. In brief, the bark is ringed and a clump of damp sphagnum moss is placed around the

(Continued on page 15)

Special Spoon Boosts Fresh Grapefruit By Making It Easy To Fix And To Eat

The secret of this special spoon for eating grapefruit is in the tiny teeth on the front edge, which make it possible to eat this healthful, vitamin-packed, delicious citrus fruit with no preparation except to cut it in half. The housewife doesn't have to remove the center, even on the kind with seeds which some people prefer because of an extra tangy flavor, or cut around the outer edge of the "meat" and between the membranes. The spoon, which has a slightly deeper bowl than an ordinary kind, will neatly extract a section from a graepfruit which has had no other preparation than cutting in half and being served on the "half-shell." Florida Citrus Mutual, Lakeland, Florida, world's biggest citrus growers' cooperative, is sponsoring distribution of the spoon at cost to stimulate use of grapefruit in fresh form. Mutual offers the spoons, which carry the widely-known William L. Rogers trademark, in units of four for $1, including postage.

TRAPPISTS INSPECT BENEDICTINE CITRUS

Brother Fenton (left) of Our Lady of Gethsemani Abbey, Trappist, Kentucky, and Brother Joachim (right) from Our Lady of Mepkin, Moncks Corner, S. C., pictured at Saint Leo Abbey, Florida, where they arrived with their tractor-trailer truck to pick up a load of Saint Leo Abbey Brand citrus. The tree is laden with both orange blossoms and oranges.

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For complete details consult your nearest dealer or write, wire or phone

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Refrigeration Ruling Saves Florida Growers Millions

A decision of the United States Supreme Court on March 4, 1957 ended a three and a half year fight by the nation's growers and shippers opposing increases in refrigeration charges on fresh fruit and vegetables by the railroads.

Luther L. Chandler, Goulds, Florida, chairman of the Florida Fruit and Vegetable Association's Special Refrigeration Case Committee, in outlining the effects of the final decision on Florida growers, said action of the Association and The Growers and Shippers League in opposing the increased charges had saved the Florida fresh fruit and vegetable industry some $3,000,000 while this fight was carried on. In addition, the industry will also save about one-half million dollars per year as long as the new present rates remain in effect.

The original request by the railroad was for an increase amounting to 31.6% for these services, which would have meant an additional cost of at least $1,000,000 each season for the fresh vegetable and fruit industry of this state alone.

"The final settlement was for a 15% uniform nationwide increase, which represents a substantial saving in costs for this essential industry, Chandler said.

"The complicated case originated in August, 1953 when the railroads filed a proposal seeking authority of the Inter-State Commerce Commision to increase the service charges on refrigeration and other protective services 31.6%. At that time it appeared as a foregone conclusion that the railroads would win their request.

"The Florida Fruit and Vegetable Association and other organizations throughout the country opposed the petition for the increase, whereupon the Interstate Commerce Commision held hearings throughout the nation. One hearing was held in Orlando.

"The record alone, exclusive of briefs and other legal documents, consists of some 5000 pages of testimony and about 300 exhibits.

"The complexity of the case was such that the proceeding was not concluded and the Commission's order released until January 1956 and then only a 15% increase was authorized, or less than half the amount originally sought. The increased rates were placed in effect in April 1956.

"The industry continued to oppose the Interstate Commerce Commision's decision and appealed the decision first to the United States District Court which upheld the Interstate Commerce Commission's decision and then to the United States Supreme Court.

"The Supreme Court affirmed the judgement of the District Court and the 15% increase was upheld.

"While of course this is a substantial increase in costs for Florida's fresh fruit and vegetable industry, as well as for other producing areas of the nation, nevertheless united opposition avoided the larger part of the requested increase and in the interim saved the industry millions of dollars.

"The Florida Fruit and Vegetable Association's Special Committee include Dixon Pearce, Miami, and John Evans, Oviedo. They and the staff of the Association worked diligently for the industry, and deserves, with other organizations, much credit for their efforts", Chandler said.

GROW YOUR OWN AND SAVE ON LANDSCAPING

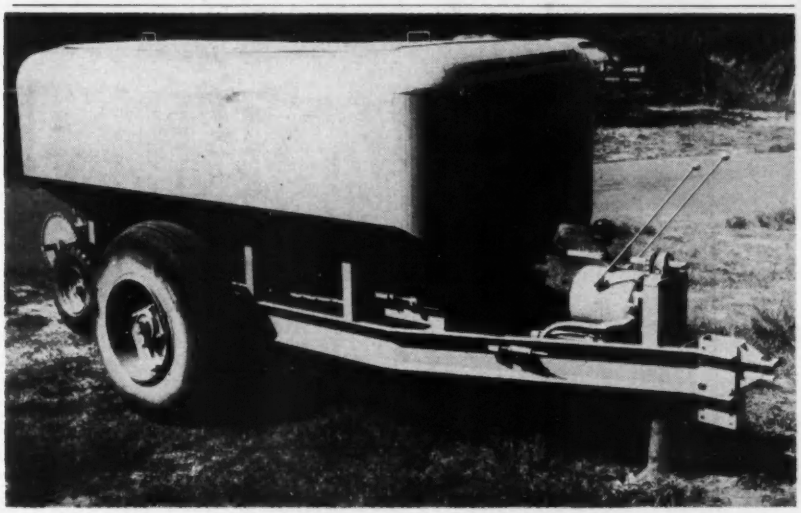
(Continued from page 13)

wound. Then polyethylene should be wrapped and tied around this clump, Joiner says. Roots will then form where the stem was wounded.

Room and food for wildlife should be kept in mind in planning the forest. Plants in wide variety are available that furnish both food and cover for game, which adds to the educational value of the tract, especially for boys and girls.

Lee County farmers are happy with their plantings of Hubam and White Dutch clover. This is the report of C. P. Heuck, agricultural extension agent. Both varieties furnished excellent grazing through the winter months.

By March 1 more than 17.5 million acres of cropland had been signed by farmers to be put into reserve acreage for 1957.



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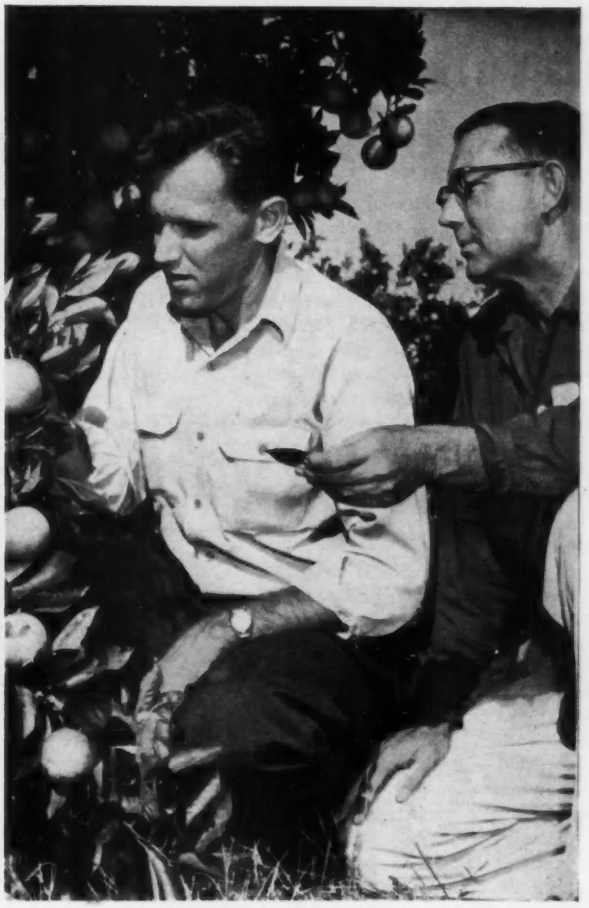
"ORTHO products have always produced highly desirable results,"

reports John M. Kennedy, Production Manager, Grand Island Citrus Co-Op, Umatilla, Fla., (pictured below, left, with ORTHO Fieldman Charles Ashley)

"In all my experience with ORTHO products I have found them to be of top quality," states Mr. Kennedy. "We have never had any leaf droppage with ORTHO N-P 90 when used as recommended. ORTHO products have always produced highly desirable results. Their field personnel have aided in field inspection and have supplied excellent technical assistance in our production operations."

"Our ORTHO Fieldman has been very helpful in our operation," writes H. C. Maddox (above), Production Manager, Sottile Citrus Division, Avon Park, Florida. "His knowledge and recommendations have helped control many of our pest problems. His outstanding assistance is of the same high caliber as the ORTHO products."



"I consider ORTHO N-P 90 to be an oil emulsion of outstanding quality as are all ORTHO products," says Don Kemp, Production Manager, Lake Region Packing Association (pictured above, right, with ORTHO Entomologist Art Whipp), Tavares, Florida.

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When you buy the ORTHO program, all the personal, on-your-ground technical advice and services of your ORTHO Fieldman are provided gladly and without any extra charge. Too, with ORTHO, you're associated with the leader. ORTHO Research first developed highly refined petroleum oil sprays in the form of new type emulsions and ready-mixes. Under such brand names of VOLCK Soluble, and Florida VOLCK these oil sprays today are known and respected by growers the world over. Include these top-choice oil sprays in your control program, too.

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Plant City—Webster Carson
West Palm Beach—Luke D. Dohner
West Palm Beach—Perry L. Sparkman

Preliminary Investigations On Dieback Of Young Transplanted Citrus Trees

GORDON R. GRIMM
Horticultural Crops Research Branch
Agricultural Research Service
USDA., Orlando

At Meeting Florida State
Horticultural Society

Dieback of transplanted citrus trees refers to a progressive dying of a pruned branch or trunk from the cut surface toward the root. It has been recognized in Florida for as long as groves have been planted. Usually the loses from this disease have been minor, but within the past few years they have increased sufficiently to warrant investigation. Large acreages have been planted at all seasons of the year, and it has become apparent that loses of young trees from dieback have increased disproportionately with the increased acreage planted.

A study of the nature and cause of dieback was started by reviewing the methods of transplanting citrus trees. No general agreement was found among growers or nurserymen as to the best method of transplanting. Practices in top prunning the trees varied considerably. Methods of handling, watering, and subsequent care also varied. A diversity of opinion prevailed on the importance of fibrous roots and of the leaves at the time of transplanting.

To determine the role of all of the various steps involved in transplanting on the incidence of dieback, controlled experiments were performed under field conditions. In conjunction with these tests, labortory isolations were made to determine the microorganisms associated with this disease.

Procedure and Results

Temple orange and Glen Navel orange on Cleopatra mandarin rootstock, ½ and 5/8 inch in diameter, were used in transplanting tests to determine the effect of top pruning, the absence of fibrous roots, and defoliation. Transplanting experiments were begun in November and March at the U. S. Department of Agriculture experimental farm 7 miles west of Orlando, Florida. Each experiment was composed of eight treatments with eight trees each replicated four times, making 32 trees per treatment (table 1). Each treatment was a combination of three separate operations; e.g., the trees for treatment 1 had branches, fibrous roots and leaves; those for treatment 8 had their branches, fibrous roots, and leaves removed. Branched trees were pruned to leave 4-to-6-inch branches; the trees without branches were pruned to trunks approximately 16 inches high; all fibrous roots and all leaves remaining after top prunning were removed with purning shears in the groups indicated. The trees were planted with a 5 x 5 foot spacing and the entire area was kept free of weeds.

Excellent, good, fair, and poor were used to describe the subsequent growth of the tree. An excellent tree had little or no dieback on the cut branches or main trunk and vigorous sprout growth; good and fair trees had relatively increased amounts of dieback and relatively decreased sprout growth; poor trees either had died back far enough to make replacement desirable or were dead. Observations were continued until no further changes in growth habit were apparent.

Table 1 shows the numbers of excellent, good, fair, and poor trees within each treatment for the November and March plantings. As a group, trees with fibrous roots present were distinctly better in both the November and March plantings than those with fibrous roots removed. As a group, trees with branches present were better than trees with branches removed, and trees with leaves present were better

Table 1. Distribution of trees by growth classes of Excellent, Good, Fair, and Poor following treatments at two planting seasons

Treatments 1/	November planting 2/				March planting 3/			
	E	G	F	P	E	G	F	P
Branches present								
Fibrous roots present								
1. Leaves present	24	7	0	1	16	5	5	6
2. Leaves removed	6	11	7	8	17	4	4	7
Fibrous roots removed								
3. Leaves present	1	3	24	4	1	2	8	21
4. Leaves removed	0	3	10	19	2	2	5	23
Branches removed								
Fibrous roots present								
5. Leaves present	5	2	10	15	11	2	9	10
6. Leaves removed	0	2	7	23	6	6	7	13
Fibrous roots removed								
7. Leaves present	1	3	6	22	2	1	7	22
8. Leaves removed	0	0	3	29	5	4	5	18

1/ Each treatment has a total of 32 trees.
2/ Temple orange/Cleopatra mandarin ½-in. planted 11-9-55. Data taken 2-23-56.
3/ Glen Navel orange/Cleopatra mandarin 5/8-in. planted 3-23-56. Data taken 6-7-56.

than trees with leaves removed in the fall planting only. Statistical analysis of both experiments showed the comparisons discussed to be highly significant.

A third experiment of 3 x 2 x 2 factorial design was made to compare entire trees exposed to the sun for 1¼ and 2½ hours with trees that shaded and had their roots protected from drying by packing in wet sphagnum moss from the time they were dug until transplanted. The influences of leaves and of no leaves and of a 3-hour delay in watering after planting in comparison with watering at planting were measured within each group. Treatments were made on ½-inch Parson Brown orange trees on Rough lemon rootstock pruned to a 16-inch trunk and planted June 7, 1956. Each of the following treatments was replicated three times with 5 trees each, making 180 trees:

1. No sun exposure, leaves on, watered at planting
2. No sun exposure, leaves on, watering delayed for 3 hours
3. No sun exposure, leaves off, watered at planting
4. No sun exposure, leaves off, watering delayed for 3 hours.
5. 1-¼ hour exposure, leaves on, watered at planting
6. 1-¼ hour exposure, leaves on, watering delayed for 3 hours
7. 1-¼ hour exposure, leaves off, watered at planting
8. 1-¼ hour exposure, leaves off, watering delayed for 3 hours
9. 2-½ hour exposure, leaves on, watered at planting
10. 2-½ hour exposure, leaves on, watering delayed for 3 hours
11. 2-½ hours exposure, leaves off, watered at planting
12. 2-½ hours exposure, leaves off, watering delayed for 3 hours

The trees exposed to the sun were laid on cultivated ground; the air temperature 3 inches above the surface was 93° F. and 112 degrees on the ground surface. All trees were planted with a 5 x 5 spacing and arranged by treatment in a definite plot design. All were watered on the day of planting with 6 gallons of water at the times designated, and every 4 or 5 days thereafter during the next 6 weeks as weather conditions required.

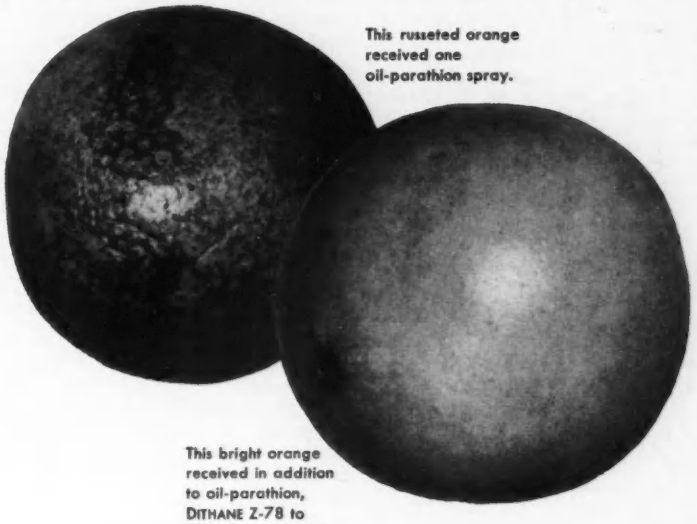
The results are summarized in Table 2 in terms of average inches of dieback of the main trunk and average inches of total new sprout growth per tree for the respective treatments. Trees exposed to the

(Continued on next page)

Table 2. Mean inches of dieback and new sprout growth 6 weeks after transplanting Parson Brown orange trees, as influenced by exposure, defoliation, and delay in initial watering

Treatment	Dieback	Sprout growth
	in.	in.
Exposure to the sun		
0 hour	1.58	32.53
1¼ hour	4.25***	17.02***
2½ hour	5.12***	3.85***
Leaves present	3.02	18.99
Leaves removed	4.28*	16.16
Watering at planting	3.59	17.63
Watering delayed for 3 hours	3.71	17.97

*Indicates statistical significance at odds of 19:1
***Indicates statistical significance at odds of 999:1


This russeted orange received one oil-parathion spray.
This bright orange received in addition to oil-parathion, DITHANE Z-78 to prevent russeting.

DITHANE Z-78
made the difference

DITHANE Z-78, the original zineb, has been used by Florida vegetable growers for disease control for over ten years. Citrus growers wishing to try DITHANE Z-78 for greasy spot control and for reduction of fruit russeting, can purchase it in 5-pound and 50-pound bags.

Experiment station tests over the past three years indicate that a single application of DITHANE Z-78 (zineb), using only 1 pound per 100 gallons of spray, is very promising for control of both greasy spot and russeting. Read "Zineb Can Cut Cost of Russet Control", by Fran E. Fisher, published in the Sunshine State Agricultural Research Report, April, 1957.

DITHANE Z-78 is available from your regular supplier. Consult your Experiment Station or pesticide supplier for directions.

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PRELIMINARY INVESTIGATIONS ON DIEBACK OF YOUNG TRANSPLANTED CITRUS TREES

(Continued from preceding page)

sun for 1¼ or 2½ hours prior to planting had considerably more dieback and less sprout growth than trees that had been protected from drying with wet sphagnum moss. Statistically the differences are very highly significant. It should also be noted that trees without leaves at the time of transplanting had significantly more dieback than trees with leaves at the time of transplanting. Time of initial watering did not affect the amount of dieback or sprout growth of the trees in this experiment.

Preliminary observations on the effectiveness of various pruning paints for the control of dieback were made during February, March, April, and May on sweet orange trees with various amounts of top pruning and defoliation. De-Ka-Go, Carbolineum, and pastes of Zineb, Orthocide, and neutral copper were applied to the cut surfaces immediately after pruning and before the trees were dug at the nursery. The treated trees were planted at random with non-treated trees and comparisons were made in the same plantings. Only 6 percent of the trees showed measurable dieback, and this seemed to occur regardless of the presence or absence of wound paint.

Several fungi and an unidentified bacterium have been isolated from trees affected with dieback. However, investigations to date have not shown any one organism to be consistently associated with dieback. Colletotrichum gloeosporioides was isolated from 60 percent of the trees; Diplodia natalensis, Phomopsis citri, Fusarium spp., and bacteria were isolated from 10 to 30 percent of the trees.

Discussion

Field observations and experimental data indicate that dieback of transplanted citrus trees is largely a result of mishandling the trees at some point during transplanting. Transplanting citrus trees involves many operations such as pruning, digging, transporting, planting, watering, and fertilizing and any one or all may be done carelessly enough to injure the tree. Environmental conditions at the time of operations, such as temperature, humidity, wind and water, and soil characteristics may also have direct influences on the success of transplanting.

The presence of healthy fibrous roots and their protection from drying at all times have proved to be important for vigorous tree growth, which apparently provides the best defense against dieback of transplanted citrus trees.

The presence of leaves can have a marked influence in preventing or checking dieback of the tree. It is not uncommon for dieback to proceed down one side of a limb or trunk on which no leaves are present and to stop on the other side at the first leaf. Exactly how a leaf stops dieback is not known; it may be only by sustaining healthy tissue through the normal leaf functions. Even though the leaves are lost shortly after planting, they may be beneficial to the tree during transplanting. In the third experiment, trees with leaves during exposure to the sun lost their leaves 2 or 3 days later, yet they had significantly less dieback than trees without leaves.

From the data obtained thus far it would seem advisable to top prune trees only moderately, maintaining 4-to-6-inch branches. This was particularly true for fall-planted trees, which were larger and stronger and had less dieback 4 months after plantings. Incidental observations have shown that the advance of dieback down a branch is often checked temporarily and sometimes permanently at the crotch.

A casual organism of dieback cannot be entirely ruled out. However, the fact that a tree has less dieback because of the presence of fibrous roots, leaves, and branches, coupled with the fact that at present no one organism has been isolated constantly from all dieback trees, suggest that good transplanting methods offer the best control of this disease. It is evident that during transplanting of citrus the entire tree, particularly the fibrous roots, should be protected from drying at all times. Once the tree has been set in the grove it should be watered at planting and again the second or the third day afterward; and, in Central Florida sandy soils, every 3 to 5 days thereafter for the first few weeks as weather conditions require.

Summary

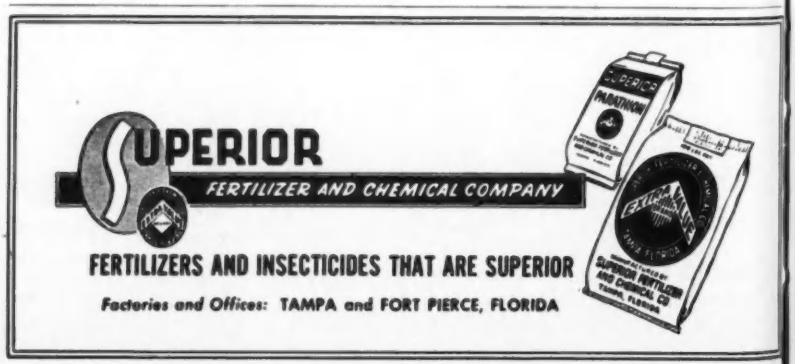
Dieback and new sprout growth of young transplanted citrus trees were measured in relation to (1) top pruning, (2) defoliation, (3) root pruning, (4) exposure of the entire tree to the sun before transplanting, and (5) delayed watering after transplanting. The preliminary results indicate that dieback may be a result of injurious transplanting operations. Healthy fibrous roots were shown to be very important for vigrous tree growth and to constitute one of the best defenses against dieback. The presence of leaves appeared to be beneficial in limiting the amount of dieback, especially in fall-planted trees.

Investigations to date give no definite indications that fungi or bacteria are primary causal agents of dieback.

MUTUAL MEMBERS TO ELECT DIRECTORS AT DISTRICT MEETINGS

Florida Citrus Mutual has completed arrangements for its 1957 district meetings, six to be held May 22nd and the seventh on June 4th, and also has again selected Nora Mayo Hall in the Florida Citrus building in Winter Haven for its ninth annual membership meeting on June 18th.

Three members of the board of directors will be chosen at each of the seven district meetings. These men, who will determine Mutual's policies and guide its operations during the 1957-58 season, will be formally seated as directors at the annual meeting.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Frozen Orange Concentrate Not Properly Handled...

Of a total of 148 samples of Florida frozen orange concentrate purchased from retail food stores in all sections of the U. S., practically all show deterioration of quality and flavor when compared with test reports on the identical batch at the time of production, according to a report made by Lamar English of the Processed Foods Inspection Service, Agricultural, Marketing Service, USDA, at the Florida Citrus Commission meeting recently.

"While 80.6% of the 1408 samples still make grade A," said Mr. English, "our taste panel agreed that in most of these samples the flavor was less pleasing than when the product was originally sampled and approved. Twelve and six-tenths percent of the samples had deteriorated to the point where they would now have to be given grade B. Another 6.6% would now be classified as sub-standard."

This investigation was made at the request of the Florida Citrus Commission, which had its staff of Merchandising Representatives pick up samples from all types of retail food stores in principal markets throughout the U. S. and return by air express in dry ice as part of a move to improve the quality of Florida frozen citrus concentrate as it reaches consumers.

Dr. L. G. MacDowell, Florida Citrus Commission, Director of Research, said, "The evidence points very strongly to the fact that Florida's frozen orange juice is not treated as a frozen product should be treated, after it leaves the warehouses of the Florida producers." He then read a summary of the temperature which the 1408 samples registered at the time they were picked up.

Temperatures of Product When Purchased

0° or below	23.0%
0° - 5°	20.4
5° - 10°	27.8
10° - 15°	16.0
15° - 20°	7.6
20° - 25°	4.9
25° -	.3
	100.0%

"Studies made in the USDA laboratories," explained Dr. MacDowell, "have shown that when held at temperatures above 0°F., quality and flavor of frozen orange concentrate start to down-grade, and the higher the temperature the faster quality declines, and the longer it is held at temperatures higher than 0°F., the greater the damage inflicted."

The Florida Citrus Commission has just started a program of education of distributors and retailers aimed at improving the methods of handling and storing frozen citrus concentrate so that the people who are most interested in expanding the market for frozen foods will take whatever steps are necessary to preserve its quality.

Frank D. Arn, Director of Merchandising for the Commission, is heading this program.

CITRUS QUEEN STARTS ON EUROPEAN TOUR

(Continued from page 4)

trip to Europe on behalf of the citrus industry, Winston Lawless of Winter Haven, president of the Exposition, said "this might be coincidence, but this is the fourth year we have sent our Queen to the European markets —and during those years our exports of fresh and processed citrus have quadrupled."

Recognizing the importance of European markets for Florida citrus, the citrus commission has established two offices abroad, one under LaRoque headquarters at Frankfort, Germany, and the other in Stockholm, Sweden.

Queen Frances is being accompanied by Mrs. Barbara Davis of Winter Haven, representing the Exposition, and her schedule includes the big fruit auctions in Hamburg and Rotterdam, with Copenhagen, Denmark, tentatively scheduled. She will spend several days in London and will visit the famous Covent Gardens, the oldest and largest fruit and vegetable market in Europe. Her return trip will start at famous Shannon airport in Ireland.

Immediately on her return to the United States she will go to Washington to participate in a meeting of the United States Chamber of Commerce—her visit to the national capital timed to coincide with a three-day citrus commission sales promotional event. Visits to Detroit and Philadelphia will follow the Washington date while her visit to midwestern markets is now being planned.

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In Florida, magnesium is now classed as a primary plant food together with nitrogen, phosphorus and potash.

The recommendations of the Florida Citrus Experiment Station at Lake Alfred, stress the need for large application of magnesium for Citrus in soluble form and state that it is usually applied as a Sulphate.

Be sure that your fertilizer manufacturer includes **EMJEO** in your mixtures as a dependable source of soluble magnesium.

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Spotted Alfalfa Aphid Threatens Nations Alfalfa Crop

Since its first appearance in New Mexico's Rio Grande Valley four years ago, a new aphid with a fantastic reproduction rate and a voracious appetite for alfalfa has spread cross the central United States, from California to Virginia.

Many agricultural authorities now consider the spotted alfalfa aphid to be the nation's most serious insect threat to agricultural production. Its rapid migration has caused widespread alarm. In 1954, the insect was reported in New Mexico, Oklahoma and Nevada. By 1956, it had moved into 15 states, penetrating north into Minnesota and South Dakota, east into Maryland and Virginia, and south to Florida. Infesting only seven southern counties in Indiana in 1956, it is expected to take over the entire state in 1957. It migrates freely from field to field; travels great distances on the wind; and even "hitch-hikes" from state to state by car, train, or plane.

In northern climates the female aphid produces from two to five living young per day without mating. Cold winters are not a bar to survival. It is not eliminated by temperatures as low as five degrees.

The damage caused by the spotted alfalfa aphid takes several forms. Seedling plants are killed rapidly. Heavy infestations may completely destroy a young stand. Aphids feeding in a harvested field can prevent regrowth by completely covering the developing shoots.

Where sufficient alfalfa survives for cutting, the stand is often ruined by the honeydew which aphids secrete while feeding. A sooty fungus growing in this honeydew soon reduces the leaves and stems to a black sticky mass. This is unpalatable, and practically unharvestable with modern field choppers and balers.

California's State Department of Agriculture estimated that in 1955 the spotted alfalfa aphid caused $13 million damage to alfalfa crops. In 1956, the aphid cut Oklahoma's alfalfa production by 50 per cent, a loss of $16 million to the growers.

So far, natural preditors such as ladybird beetles, lacewing flies, and syrphid flies, have not provided any dependable measure of control. Researchers feel there is promise in this line of attack and are working with a variety of preditors, including a fungus that kills aphids.

At present, the best control method for alfalfa growers is still prevention. The most effective method of control is chemically, with malathion. This widely used and versatile insecticide was developed by American Cyanamid Company. Malathion offers high aphid kill, extremely low hazard to humans and animals, and a short time interval between application and harvest.

With malathion, there is hope of checking the advance of the spotted alfalfa aphid, and preventing the sticky mess of ruined alfalfa it leaves in its wake. Cooperative programs by growers groups have been highly successful in eliminating "incubator fields." By prompt application of malathion dusts or sprays—at the first sign of honeydew—growers have gained important secondary benefits since malathion also controls leafhoppers, mites, spittlebug adults, alfalfa weevil larvae, vetch brucid, and grasshoppers. Stopping the damage of these other pests, helps to further increase the yield and quality of the crop.

Citrus Re-Greening Worrying Growers

Mother Nature is on a re-greening rampage, causing many sleepless nights for Florida citrus growers, packers, shippers and the nation's retailers.

"Every once in awhile, Nature creates weather conditions which cause green color to re-appear in the skin of Florida oranges and grapefruit before they can be marketed," says Dr. L. G. MacDowell, Director of Research for the Florida Citrus Commission. "This is one of those seasons in Florida when Mother Nature is really running wild."

Dr. MacDowell explains that the combination of hot weather and heavy rainfall accelerates the trees' production of chlorophyll necessary to the development of next season's crop. During this flush of growth, excess chlorophyll backs up into the citrus fruit causing Florida oranges and grapefruit to turn green on the outside while being fully ripe on the inside.

Hence consumers look twice before buying fresh Florida oranges and grapefruit — while Mother Nature chuckles.

The matter is of such concern to the big citrus industry that the Florida Citrus Commission is devoting considerable television time to spotlighting the antics of Mother Nature, pointing up the fact that the fruit is fully ripe though it may have a greenish tint in the skin.

Paul S. Patterson, Director of Advertising for the Commission, said that copy for all television advertising of fresh Florida oranges and grapefruit for the balance of the citrus season will carry the message that the green is "only skin deep." Trade newspaper ads have alerted wholesalers and retailers to Mother Nature's capers by explaining that by halving a few Florida oranges and grapefruit in mass displays, consumers will see that the fruit is of the peak-of-the-season ripeness and flavor while the skin only appears to be green.

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Florida Lime Marketing Agreement-Order Amended

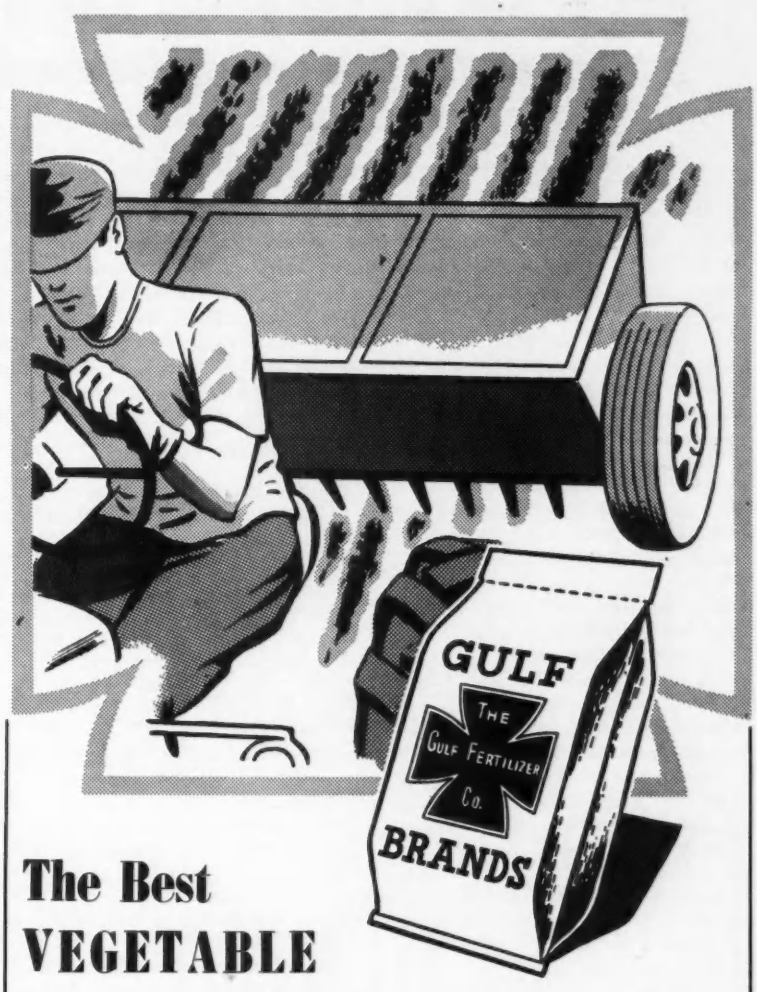
Amendment of the marketing agreement and order regulating the handling of limes grown in Florida was announced today by the U. S. Department of Agriculture. This action follows approval of the amendments by 93 percent of the growers voting, and 97 percent of the volume voted, in a referendum conducted March 14-23. Handlers of 54 percent of the limes shipped during the 1956-57 marketing season have signed the amended agreement.

Principal amendments would (1) permit only growers or producers having proprietary interest in 10 or more bearing lime trees to participate in the nomination of grower members of the committee; (2) provide for simultaneous meetings of groups of committee members at two or more places through the use of telephone communication, with loud speaker receivers; (3) authorize establishment of a reserve fund to finance certain program operations; (4) provide for the handling of limes under marketing research and development projects exempt from regulations; (5) authorize establishments of pack specifications and require packs of lime graded and packed in accordance with such specifications to be identified by appropriate labels, stamps, or tags; and (6) require handlers, in filing reports on the disposition of limes, to show the destination, by State, zone, or market area, for each lot of limes handled.

EXPANDED FARM PRODUCTS SEEN AS SURPLUS SOLUTION

Development of new uses for farm products by industry was suggested as a way to solution of problems of surpluses in agriculture in an interim report to Congress issued on April 19th by the President's bi-partisan Commission on Increased Industrial Use of Agricultural Products. The Commission's recommendations visualize a greatly expanded research program in agricultural products utilization.

The proposed program, if the Commission's recommendation were to be adopted by the Congress, would be administered by a bi-partisan Agricultural Research and Industrial Board of five members.



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Careful manufacturing means each bag contains the right plant food elements — properly weighed and mixed — that are needed to give more growing power to your land.

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MORE THAN 53 YEARS SERVICE TO FLORIDA AGRICULTURE

Program Developed For Solving State's Crucial Water Problems

An 11-point legislative program for protecting, conserving and managing the state's all-important resources has been approved by the Florida Water Resources Study Commission for presentation to the governor and the 1957 legislature.

The recommendations culminate almost two years of intensive study, including public hearings in all 67 counties to compile information on problems peculiar to each section and general hearings on over-all water problems.

Two types of administrative agencies are suggested, with the final decision on which method to use left to the legislature. One would create a new department in the present state board of conservation. The other would bring into existence an entirely new agency to be known as the water resources commission, whose members would be appointed by the governor.

Regardless which agency is finally decided upon, any regulations would be issued only after full public hearings. All decisions would be subject to appeal in the courts.

First recommendation on the list is a proposal that an effective and useable law be enacted, preserving as far as possible the existing rights of water users as developed under present statutes.

The present riparian system of water law is well suited to Florida's climate and hydrology, the study commission believes, and any law should not alter the rights of present water users.

However, the commission sees an urgent need for a set of legal definitions to clarify existing water law and the rights of the people under it. Many terms in common use today need legal defining, including such words as watercourse, riparian land, flood waters, navigibility, lakes, diffused surface water, underground streams, percolating waters and atmospheric waters.

There is legal doubt, the commission points out, to what extent the term "lakes" covers artificially produced bodies of water and this needs to be clarified.

One recommendation the commission wants included in any new water law would authorize the "capture, storage and use of waters, including flood waters, in excess of existing reasonable use, including diversion of such waters beyond riparian or overlying land." The commission emphasizes this would not involve interference with existing rights of riparian owners but, at the same time, would permit others to make beneficial use of excess waters now being wasted.

Another proposal involves conservation of water in regions where diversion of surface or underground waters exceeds or threatens to exceed natural replenishment or where such water may become unfit for use because of salt water intrusion or other causes.

The commission uses St. Petersburg's water supply as an example of the savings which could result from proper regulation of existing fresh water supplies.

In 1930, the commission points out, St. Petersburg was forced to abandon its water supply wells because of salt water intrusion in Pinellas county. It cost $2,600,000 to develop a new source of supply and since 1951 an additional $5,100,000 has been invested to meet the city's growing water needs.

"If ground water withdrawals had been regulated to prevent destroying the usefulness of the aquifier (fresh water) but permit a safe and sustained yield, the city and others could still be using the original source to supply a portion of the area's needs," the commission emphasizes. "The recommended agency could act to prevent similar damage in other areas."

Even more important than the financial savings, the recommendations state, "is the stimulating effect which a comprehensive law would have on the state's economic development. Delay in establishing a single large industry while its water rights are being determined could cost far more than the proposed new department or commission. Expense of litigation involving water rights would be sharply reduced by relying on the new agency for decisions in such matters."

Beach and shore erosion problems also would come under the new commission or department, which would make recommendations concerning laws needed to protect the state's coastal areas, waterways, inlets and harbors from excessive erosion.

The commission believes much can be done to minimize natural and man-made erosion of public lands, if a state agency is given the responsibility for making a comprehensive study and report on the subject.

Another recommendation would require permits for all artificial weather modification attempts, including those at inducing more rain to fall.

"If weather modification attempts are successful," the commission points out, "the state should maintain continuous surveillance over such operations to determine their influence on the state's water resources. If the attempts are not successful, the public should be so informed."

The report is signed by Byron E. Herlong, Leesburg, chairman of the water resources study commission, and the other six members.

Passage of the proposed water resources law would add no red tape beyond what already exists where a homeowner wanted to drill a well to obtain water for domestic purposes.

Use of water for "ordinary livestock consumption" also would not be affected.

This is revealed with release of the wording of the proposed new law to establish either a completely new state agency, to be known as the water resources commission, or create a water resources department in the state board of conservation.

The proposed law is the result of two years of study by the Florida water resources study commission, created by the 1955 legislature to survey Florida's complex water problems and make recommendations to

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the 1957 session for correcting them.

Regardless which type of administrative system is finally decided upon by the legislature, one section of the proposed law specifically states that no provision shall apply to:

"Individual users of water for domestic purposes or ordinary livestock consumption."

The new agency would have the power to determine whether a specific situation came under the provision of "ordinary livestock consumption" but, as in all matters involved in the law, any dissatisfied person could go to court if he felt he wasn't being treated fairly.

There are two other exemptions in the proposed law. One covers rivers or streams which are boundaries of the state, and the other prevents control of water-borne wastes from municipalities or industries.

Efforts to pass a comprehensive water law in Florida in past years have sometimes been complicated by a belief that a special permit would be needed even for a farmer to drill a well to supply his home with water. Cattlemen also have not been too eager for any type of water law which might create more red tape for them when they decide to drill a well.

Medfly Regulated Area Reduced To Two Fla. Counties

Broward and Pinellas Counties and parts of Dade and Lee Counties, Florida, in which the Mediterranean fruit fly has been eradicated, was released from Federal regulations on April 16, the U. S. Department of Agriculture announced recently.

Florida areas remaining under regulation comprise approximately the northern third of Dade County, and the cities of Fort Myers and North Fort Myers, in Lee County. Interstate movement of certain fruits and vegetables from these areas will continue under regulation.

Intensive survey and trapping activities carried on in the areas released from the quarantine regulations have failed to disclose any Medfly infestations for a period of three months. Therefore the Department considers it safe to remove the treatment, certification, and other requirements that have been operative in the areas.

Eradication of the Medfly in the released areas was accomplished largely by means of airplane-applied poison bait sprays.

Mutual Broadens Reward To Cover Theft Of Young Citrus Trees

Young citrus trees are valuable these days — so much so that Florida Citrus Mutual has broadened its reward offer to cover them along with citrus fruit.

Almost from the start of its operations almost nine seasons ago, Mutual has had a standing offer of a reward of $100 to anyone for helping catch and convict a thief for stealing fruit from a Mutual member's grove. It has paid the fruit-stealing reward a score of times over the years, as part of its over-all program to strengthen the laws against fruit theft and obtain more stringent enforcement.

Now the same $100 reward is offered where the apprehension and conviction of a person caught stealing young fruit trees is involved.

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Reports Of Our Field Men . . .

EAST HILLSBOROUGH AND PASCO COUNTIES

E. A. McCartney

We have had plenty of rain as you all know which came at the right time for citrus groves and pastures. This no doubt saved the new crop of fruit as the heavy bloom needed moisture to set a crop and as of now it looks as though it will set. It could be the largest crop we ever have had, but the vegetable and melon growers are hurt and may loose in proportion to the citrus growers gain — especially on low and flat land.

We are spraying now between rains with a Zinc-Copper-Oil. Considerable melanose on new growth due to the dead wood caused by the cold weather, some scale and red spider, but not as bad in my opinion in this territory as shown by the chart received from the Lake Alfred Experiment Station excepting rust mite. There is a heavy infestation of rust mite in most groves I have checked. Some growers are spraying or dusting for this condition. We are checking groves for this summer fertilization which will start in May — probably after this reaches you as it is two or three weeks before the Citrus Industry is ready to be mailed to you.

Considerable pruning is being done. New growth is showing up well and new bloom also as of this date, April 14th, so we may have some fresh fruit all summer.

SOUTH POLK, HIGHLANDS, HARDEE, DeSOTO AND SARASOTA COUNTIES

C. R. Wingfield

Mid-April finds us still having winter weather. Cool winds and rains have damaged some vegetable crops but citrus has been blessed by the rains. However, it can be noticed that the winds have caused some dehydration of foliage which results in a hungry looking tree.

With good moisture conditions the growers are busy with spraying and disking, making ready for the summer fertilizer application, which will by May 1st be well under way. With the tree condition as it is a well balanced mixture will be used with many requesting a large amount of organic. With the last two years being dry there is a feeling this might be a wet summer. Calcium and pH levels should be carefully watched to assure full benefit of fertilizer.

The new crop of fruit appears to be rather spotted especially in the mid-season varieties. In blocks there will be one tree heavy and the next one light. So guess we can say midseason fruit will be only fair. Valencias had a heavy bloom and at the present looks as if there will be a good crop, however, we are witnessing a lot of drops at the present.

The old valencia crop have been moving rather slow but think more activity will be seen by May 1st. Grapefruit is being cleaned up rapidly.

NORTH CENTRAL FLORIDA

V. E. Bourland

We have had some good rains, and everything is looking like a happy spring. Most groves have all ages of fruit ranging from golf ball size down to bloom with good growth. Seems that most growers are going to make an effort to make better quality fruit, most have started out with spraying and good care. Young trees are looking good. There are quite a few valencias being moved at the present time, also grapefruit.

WEST HILLSBOROUGH AND PINELLAS COUNTIES

J. A. Hoffman

Groves are looking extremely good at this time with a flush of new growth. Most early and mid-season varities of oranges bloomed again in April and apparently there is a good setting for next year's crop.

In most cases a post bloom spray has been applied and harrowed, and now are preparing for the Summer application of fertilizer which will be underway by the reading of this report. The Summer application should be completed by early June.

SOUTH HILLSBOROUGH AND MANATEE COUNTIES

J. D. Toll

In this territory we have had more rainfall so far this spring than the total for 1956. For the citrus groves this is fine as it has cut the cost of irrigation and has helped to set an excellent crop of fruit in most groves. On the other hand vegetable farmers have had a great loss due to the excessive rains and have had difficulty trying to get their crops through.

By the middle of May the summer fertilizer program for citrus groves will be in full swing. Most of the growers are following that essential practice of fertilizing young trees every six weeks from early spring through to October, and with present rains are now being rewarded with a fine flush of sturdy new growth.

HIGHLANDS AND POLK COUNTIES

J. K. Enzor, Jr., & R. E. Lassiter, Jr.

Due to recent heavy rains most citrus growers are beginning to apply their summer fertilizer application. Probably by the first of May the summer application will be well under way. These recent rains have caused a very decided improvement in the appearance of most groves.

It is still very difficult to form an opinion as to how much fruit has been set for another year. Bloom has been spotty and very prolong in Pineapple and Valencia oranges. Some Valencia blocks have been blooming for the last eight or nine weeks. The usual droppage of young fruit is taking place at this time and it is hard to tell just how much of the fruit will remain. However, it looks as though we will have a good Valencia crop and possibly a little lighter mid-season crop. The set of Duncan and Marsh Seedless grapefruit is definitely spotted.

At this writing the matured Valencia crop is moving out very slowly. The growers and handlers apparently cannot arrive at a value for this fruit. Mature Valencias seem to be sizing very well now. However, most blocks that we know of which have been picked have picked less fruit than they did a year ago. We still feel that the estimate is high.

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Uncle Bill Says:

Every now and then we wonder if us Florida growers ain't missin' some bets by not puttin' up a big holler fer price supports like the government is givin' farmers and dairy folks in certain other sections of the country . . . but then we git to thinkin' that its purty nice in a way to be standin' on our own feet, takin' the ravages of insects 'n weather 'n all the other things that us growers has to expect in our business but realizin' that when we total up our profit at the end of the year we don't owe no agency nothin' . . . 'n that what we've made represents the results of our own efforts.

They is plenty of times when it would be mighty nice to have someone hand us a hunk of money to help us out in our troubles . . . but they is an old sayin' that mighty few things comes to use for free . . . and even when they ain't nothin' left over at the end of the season we jist figger we've had a bad year but that the next year will be better . . . and it usually works out that way . . . and they is a lot of satisfaction in knowin', when we do make a profit, that what we've made has been the results of our own efforts.

The government has helped us a lot in emergencies like the spreadin' decline and with the Med flies, but somehow that seems different than havin' Uncle Sam make up the deficit when our fruit and vegetable crops don't happen to bring in as much as we think they ought to.

Us Florida growers is sort of independent folks and with all the other things the government is supportin' partly with the aid of our tax payments seems like we jist don't want to make that load any heavier . . . besides they is a lot of satisfaction in knowin' that we've built up a mighty big industry without much outside help.

A lot of us has learned that we kin produce the Maximum Crops of Finest Quality by usin' Lyons Fertilizers . . . and a lot of us is jist going to keep on growing the best crops in Florida by following this slogan.

Agricultural Research To Make Agricultural Chemicals Safe

WILLIAM D. HOGAN*
E. I. Du Pont de Nemours & Company, Inc.

The chemical industry must take for granted the fact that one of the largest single cost items in the development of biological chemicals is the research necessary to assure that these chemicals can be marketed without introducing a hazard to health.

Obtaining this kind of basic information before we market garden chemicals is part of our company's traditionally high standard of safety. It also provides some of the data we present to the federal government when we wish to register a pesticide for a specific use. The high standards of safety in pesticides have placed great emphasis on some highly technical aspects of analytical chemistry. When it is established under the law that a residue of only one part per million — or seven, or 14 — then it seems natural to wonder how anyone can tell the difference. One part per million, for example, is roughly equivalent to an ounce of pesticide evenly distributed in 30 tons of produce.

Organic Pesticides

Fifteen years ago, when most pesticides were based on simple inorganic derivatives of lead, arsenic, sulfur, etc., the problem was more straightforward than today when complex organic compounds are the general rule. Today's analytical chemist working with pesticides is a specialist trained to use diverse tools — physical and electronic as well as chemical. It is his job to develop analytical methods to detect unmistakably the specific chemical and to measure accurately the minute amounts which may be present at harvest time. One common approach, is to react the chemical, or some part of it, to form a characteristically colored dye, the intensity of color developed being a measure of the amount of active chemical present. And the chemist no longer has to depend on his own judgment to evaluate the end result — he uses a colorimeter or a spectrophotometer to measure the degree of color development.

Even with all of the technical skill of the chemist and the aid of the finest equipment and facilities, development of a satisfactory analytical method for a chemical often takes a lot of time. In addition, the validity of the method must be established for each new crop analyzed.

Research Problems Continue

It would seem from what has been related that so much has been done there must be little left to do. This might be true if we were growing things in vacuum or a sterile laboratory, instead of out under the sun and moon, the wind and the rain.

Control With Antibiotics

Antibiotics such as streptomycin, terramycin, and aureomycin seem to have no detrimental effect on the growth of warm-blooded animals but are deadly to bacteria. Experimental work has indicated promising results in the control of fireblight of apples and pears, "wildfire" in tobacco, walnut blight, bean blight, cotton wilt and others.

Systematic insecticides applied to the soil, to the foliage or injected into plants have no visible effect on the growth of the plant or the beauty of its flowers, but pests like aphids and mites which feed on the plant juices die and the plant may remain free of these pests for sometime thereafter. Plant growth regulators may someday make blossoms last longer and extend the blooming period. With some plants they are already being used to simplify hybridization.

Use of Atomic Energy

Even atomic energy is being applied to research in the field under discussion. Compounds can be made up with radioactive atoms which do not affect the normal behavior of the compound, but the course of the material through the plant can be watched with a Geiger counter. Thus it is possible to observe whether the material remains in the roots, moves to leaves, goes into the growing tip of the flower, or how it is otherwise utilized in the metabolism of the plant.

There is still a lot of good shooting ammunition left in our arsenal of agricultural chemical weapons which have hardly seen any more than a mere baptism of fire in the hands of farmers, once their fire power had been well established by the research scientist in his laboratory. While this shooting goes on and increases, I hope, one can rest assured that newer and more potent weapons are being forged on the anvil of necessity which never seems to cool off because of "nature's" constant struggle to fight off wholesale destruction of any of her species, be they hurtful or helpful, weeds or bugs, spores or blights.

* Excerpts from an address delivered before the Soils and Crop Science Society of Florida, Clearwater, Fla. It seems that as fast as we take chemical steps to eliminate or greatly reduce species of insects, mites, nematodes, fungi, and bacteria, and weeds, "Mother Nature" steps in to thwart our efforts. In order to stay a few jumps ahead of her, research must go on, not against a so-called biological balance but for a balance of "law and order." Just to cite a few of the newer weapons coming along I might mention: 1) antibiotics, 2) systematic insecticides and fungicides, 3) plant growth regulators 4) atomic energy.

CITRUS INSECT CONTROL FOR MAY, 1957

(Continued from page 3)

factory if thoroughly applied.

Scale Control: The most effective scalicide known for Florida citrus is the combination of 0.7% oil emulsion plus 1.0 pound of 15% parathion per 100 gallons of spray. This mixture, as well as being excellent for scale, is very effective against purple mite. However, even this small amount of oil can cause oil blotch, a grade-lowering blemish that occurs when Temples and oranges are sprayed with oil when the fruit is between ½ and 1-½ inches in diameter. Oil blotch is always roughly proportional to the amount of oil used.

Next in order of effectiveness to the combination of oil and parathion are parathion 15% wettable powder or its equivalent in other formulations, 25% malathion wettable powder at 5 pounds or 1.3% oil emulsion. Parathion or malathion are, of course, preferable to oil where sulfur is needed for rust mite control since oil and sulfur cannot be combined.

Purple Mite Control: Although, as mentioned above, purple mite control will not be considered essential in most groves if the present moist conditions continue through May and

June, it may be necesary to control this mite where groves have a minimum of foliage or are in an otherwise weakened condition. Unfortunately, the recommended miticides are far less effective during warm weather than during the cooler winter months. Oil emulsion at 0.7% actual oil is the most effective and, therefore, preferred miticide for spring use. Ovex may be used where it is undesirable to use oil, providing it has not been used in the same grove during the previous 12-month period. Ovex is preferred to aramite or Systox because ovex is the most effective against mite eggs which are now far more numerous than the mites themselves. Use ovex at 1-½ pounds per 100 gallons. Systox may be used at not less than 1 pint per 100 gallons and the recommended dosage of 45% aramite is 2/3 pound.

Texas Citrus Mite Control: Sprays recommended above for control of purple mite are also suggested for the Texas citrus mite. In addition, although wettable sulfur should not be expected to control this mite, it usually destroys most of the active stages.

Mealybug Control: Mealybugs are most easily controlled before the fruit is set because these insects have a tendency to congregate under the button of the fruit where they are difficult to hit with a spray. The tighter the button is pressed against the fruit, the harder it is to control them. For this reason, mealybugs should be sprayed as soon as possible.

The most effective insecticide against mealybugs is parathion at a dosage of 1.7 pounds of 15% material per 100 gallons of spray. Oil emulsion is ineffective, but 25% malathion at 5 pounds per 100 gallons may be used in place of parathion.

Regardless of the material used, thorough coverage of all parts of the tree including the trunk and limbs is necessary for maximum results.

Six-spotted Mite Control: The miticides recommended for purple mite control are also considered effective against six-spotted mite. In addition, lime-sulfur at 2 gallons per 100 gallons of spray is also effective. For good results against six-spotted mite, thorough coverage of the undersides of the leaves is essential because this mite congregates in colonies on the underside of the leaves.

Soft Brown Scale: A few outbreaks of soft brown scale have occurred in some areas. Parathion is not effective against this scale, but 25% malathion at 3 to 5 pounds per 100 gallons or 1.3% oil emulsion are generally effective.

Details of spray schedules and the various materials used will be found in the "Better Fruit Program" and this should be consulted to determine which materials may or may not be combined. For further information, consult the Citrus Experiment Station at Lake Alfred or Fort Pierce.

Touring Spain After The Freeze

By J. Henry Burke
In California Citrograph

The author, who is marketing specialist, Foreign Agricultural Service, USDA, was in Spain last summer where he traveled more than 2000 miles, visiting all the major citrus producing areas to survey the damage following the disasterous freeze of February, 1956.

A recent report on his observations is summarized here.

In world production of oranges and tangerines, Spain is the second most important area, surpassed only by the United States. Spain also is the world's third most important source of lemons.

Having a season similar to Florida's, oranges are harvested in volume from about Nov. 1 - June 1. The season begins with the Washington naval (a variety imported from California,) the "Comuna" (a seeded nonblood) and the Cadenera (a seedless nonblood early orange of excellent quality.)

Picked from about November 1 - March 1, these three varieties comprise approximately half of Spain's production and acreage. About 40 percent of the production is blood oranges, harvested in volume from February 1 - May 1.

Late varieties, harvested after April 1, are the Berna or Verna, a Spanish nonblood orange and a very small quantity of valencias. These comprise less than ten percent of total production.

Spain's oranges are of superior quality.

All of the citrus acreage is irrigated and trees are closely planted and usually pruned. Large amounts of nitrates are used and high yields

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per acre attained. Nearly all orchards are hand cultivated.

The extensive survey made following the February freeze indicated that the least damaged areas are the coastal districts producing blood oranges harvested February - May. Heaviest damage was in the interior nonblood early orange districts in the provinces of Valencia and Castellon.

The freeze will therefore affect Spain's processing industry for several years. Shortage of fresh oranges will be during the early season. November - February. Since the blood orange producing areas were only slightly damaged Spain's supply of oranges from February - June will be nearly normal in 1958.

Tree Recovery Expressed in Production

Year	Sweet & Bitter Oranges	Tangerines	Lemons
	1000 BOXES		
1954-55	35,275	2520	1016
1955-56*	46,130	2800	1730
1956-57	12,400	600	300
1957-58	24,630	2200	870
1958-59	30,630	2800	1300
1959-60	34,660	2800	1700
1960-61	38,700	2800	2000

* Pre-freeze estimates.

Spain cannot hope to recover pre-freeze production by the 1960 - 61 season, it is believed, even with the young groves coming into bearing.

Tangerine production will quickly return to normal and, because of the shortage of early oranges, tangerines will probably be high in price for the next few years.

Lemon production will be reduced until 1958 - 59 when a normal crop should be expected. As the new plantings come into bearing, Spain can have record lemon production of 2 million boxes by the 1960 - 61 season.

These estimates assume that there will be no furher frost damage. If Spanish weather is normal, further frost should be expected by 1961.

For the American citrus grower, Spain's frost damage creates favorable market circumstances. There will be above normal opportunities for exporting winter oranges to Western Europe in the next few years. Because Spain will be short of processing oranges, there will be good opportunities to develop additional outlets for concentrated orange juice for bottlers' bases. There also will be increased possibilities for the export of essential oil of orange for use by bottles of soft drinks.

Summer lemon exports from the United States in 1957 should be of record volume since Italy has a small summer lemon, or Verdelli crop, and Spain's production will be very limited.

USDA PROPOSES REVISION OF U. S. STANDARDS FOR PERSIAN LIMES . . .

Revision of the existing U. S. Standards for Persian (Tahiti) Limes was proposed recently by the U. S. Department of Agriculture. When promulgated these standards will supersede those effective since August 31, 1952.

Principal changes include clarification in the wording for color classifications and rewording of the definitions of damage and serious damage by blanching. The new wording would permit whitish to yellowish green areas (caused by shading) to cover 25 and 50 percent, respectively, of the surface of limes of U. S. No. 1 and U. S. No. 2 grades.

The Application of Tolerance statement would be amended to make it more adaptable to packing of limes in consumer packages. A new section setting up requirements for Standard Pack has been added.

Commercial production of Persian limes is confined to Florida. During the 1955-56 season a crop amounting to 400,000 boxes, with a value of approximately $1.2 million, was produced.

The proposal was published in the March 22, 1957, issue of the Federal Register.

ORLANDO DEALERS ENJOINED FROM OPERATING IN PRODUCE TRADE

Vincent J. Squillante and Anna Rosanna Squillante of Orlando, Fla., were fined $500 and costs and enpoined by the Orlando Division of the U. S. District Court on March 19 from operating in the produce business without a valid license under the Perishable Agricultural Commodities Act.

More than three years ago, on March 24, 1954, the U. S. Department of Agriculture had revoked a PAC Act license which had been issued to Vincent J. Squillante, Inc., of which Vincent J. Squillante was secretary-treasurer, for failure to pay for a number of purchased, consigned, and joint-account shipments of fruit. The total amount was $76,730.77.

The court found on March 19, 1957, that Vincent J. Squillante and Anna Rosana Squillante, doing business as Hanford Fruit Company at Orlando, had been operating in interstate commerce since September 23, 1955, without a valid PAC Act license. The defendants consented to entry of the injunction order.

Evidence adduced by USDA showed that between September 1955 and September 1956 the defendants had bought and shipped 32 carloads of grapes on consignment from California; and that from February 16, 1956, to March 21, 1956, they had made various shipments of oranges from Florida — all in violation of the PAC Act.

The court issued a permanent injuction against the defendants, their agents, servants, employees, attorneys, and all persons in active concert or participation with them, from carrying on business as commission merchants, dealers, or brokers in perishable agricultural commodities in interstate or foreign commerce, without a valid and effective PAC ACT license.

Lake County Extension Agent R. E. Norris reports that the current citrus blooming season has been unusually long. The bloom has also been heavy, although it's been noticeably spotty and, on some trees, lacking.

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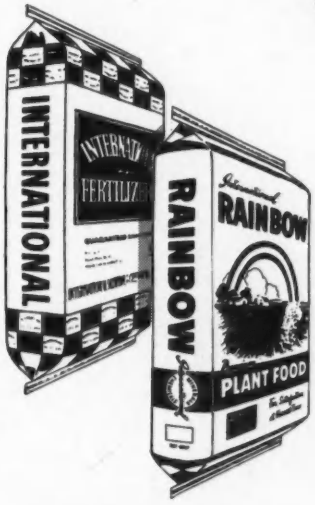

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